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10/608,206	06/30/2003	Keith Istvan Farkas	200208214-1	7647

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EXAMINER	
TRAN, VINCENT HUY	

ART UNIT	PAPER NUMBER
2115	

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/608,206	FARKAS ET AL.	
	Examiner	Art Unit	
	Vincent T. Tran	2115	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,8-16,18-20,22-34,36-40 and 42* is/are rejected.

7)☒ Claim(s) *4,7,21,35 and 41* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 June 2003* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Action is responsive to the amendment filed on 2/21/2006. Claims 1-42.

Allowable Subject Matter

2. Claim 4, 7, 21, 35, 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 10, 16, 18, 25, 29-32, 39 are rejected under 35 U.S.C. 102(a) as being anticipated by Bodas US 20040163001.

5. As per claim 1, Bodas discloses a method of controlling power consumption for at least one computer system, the method comprising:

detecting an amount of power consumed by the at least one computer system [paragraph 0028];

comparing the amount of power consumed by the at least one computer system to a threshold [step 605 fig. 6], wherein the threshold is based on the maximum power output of the

power supply [paragraph 0005-0007, 0023, 0033], wherein the power supply for the at least one computer system has maximum power output based on an average power consumption of the at least one computer system [paragraph 0025][1]; and

place one or more components of the at least one computer system in a lower power state to reduce power consumption in response to the amount of power consumed by the at least one computer system exceeding the threshold [step 620 fig. 6; paragraph 0029].

6. As per claim 16, Bodas discloses a system generating power for at least one computer system, the power system comprising:

at least one power supply operable to provide power for the at least one computer system [240 fig. 2];

a power monitor operable to determine the power consumption of the at least one computer system [205 fig. 2]; and

a power provisioning system [250 fig. 2, 3] operable to compare the power the power consumption of the at least one computer system to a threshold associated with a maximum capacity of the power supply, and further operable to place one or more components of the at least one computer system in a lower power state in response to the measured power output exceeding the threshold [step 605 fig. 6];

[1] In summary, Bodas teaches, in prior computer system, the manufactures typically designed the power supply to be able to handle the maximum estimated power consumption of the components in the computer system which referred as Pmax. However, in reality this Pmax usually based on an assumption that the computer system is configured with the most power hungry components which resulting in inflated estimated power consumption and an over design power supply. Therefore, Bodas teaches it would be more efficient and less expensive if the system is design base on the average power consumption of the components in the computer system.

wherein the maximum capacity of the power supply is based on an average power consumption of the at least one computer system [see discussion in claim 1].

7. As per claim 18, see discussion in claim 1.

8. As per claim 10, Bodas discloses the prioritizing applications running on the multiple computer systems; wherein

the step of placing one or more components in a lower power state further comprises identifying one of the multiple computer systems running one or more low priority applications, and placing at least one component in the identified computer system in a lower power state [paragraph 0036].

9. As per claim 25, Bodas discloses the at least one computer system comprises multiple computer systems [fig. 3], and the power provisioning system is operable to prioritize the multiple computer systems for placement in lower-power state based on an importance of applications executing on the multiple computer systems [paragraph 0036].

10. As per claim 29, Bodas discloses the at least one computer system comprises multiple computer systems receiving power via a power bus, and the power provisioning is operable to disconnect a portion of a power bus to place one of the multiple computer in a lower power state [inherent fig. 2].

11. As per claim 30, Bodas. discloses the power monitor [205 fig. 2] is connected to the at least one power supply [204 fig. 1]to measure the output power of the at least one power supply for determining the power consumption of the at least one computer system [paragraph 0042].

12. As per claim 31, Bodas discloses the at least one computer system comprises multiple computer systems connected to the at least one power supply via a power bus [inherent fig. 2 and 3], and the power monitor is connected to the power bus to measure the power consumption of the multiple computer systems [paragraph 0033-0034].

13. As per claim 32, Bodas discloses the one or more components comprise one or more of a processor, a floating point unit, one or more storage devices, one or more memory ICs, and a cache or a portion of a cache [inherent].

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

16. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

17. Claims 33-34, 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas in view of Montero et al. US 20030015983.

18. As per claim 33, Bodas teaches a system comprising:

a multiple computers housed in an enclosure [100 fig. 3];

a cooling system [270 fig. 3] operable to distribute cooling fluid to the multiple computer systems in the enclosure based on one or more of the power consumption and heat dissipation of the multiple computer system; and

A power system connected to the cooling system [270 fig. 3] and including a power supply [240 fig. 2] operable to generate power for the multiple computer systems and a power provisioning system [250 fig. 3], wherein the power provisioning system is operate to control power consumption of at least one or the multiple computer system based on the information received from the thermocouples.

Bodas does not explicitly teach the power provisioning system is operable to control power consumption based on the availability of cooling resources.

Montero et al. teach another computer system includes a plurality of cooling fans configured to provide sufficient cooling to the system. Specifically, Montero et al. teach a power

system connected to the cooling system [330, 334 fig. 2B] and including a power supply [214] operable to generate power for the multiple components in a computer system and a power provisioning system [287 fig. 2B] is operable to control power consumption of at least one of the multiple computer system based on the availability of cooling resources for the multiple component in a computer system [paragraph 0028, 0029, 0046].

Bodas and Montero are analogous art because they from a similar problem solving area; preventing over heat in a computer system.

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Bodas with the determining of cooling resources of Montero et al.

The motivation for doing so would have been to save power by providing the system with only the required cooling resources necessary to keep the system operating in an acceptable thermal condition; and at the same, preventing damage to the system when there is an insufficient cooling resources.

Therefore, it would have been obvious to combine Bodas with Montero et al. to obtain the invention as specified in claim 33.

19. As per claim 34, Bodas teaches [inherently from paragraph 0014, 0054-0056] the cooling system is designed based on a nominal heat dissipation of the multiple computer systems [inherent from paragraph 0023] and the power supply is designed based on the nominal power consumption of the multiple computer systems [see discussion in claim 1].

20. As per claim 36, Bodas teaches the power provisioning system is operable to compare the power consumption of the multiple computer systems to a threshold associated with a maximum capacity of the power supply [see claim 1] and reduce the power consumption of at least one of the multiple computer systems in response to the power consumption exceeding the threshold [fig. 6].

21. As per claim 37, Bodas discloses the enclosure is a rack [100 fig. 3].

22. As per claim 38, Bodas discloses the enclosure is a data center [100 fig. 3].

23. Claims 2-3, 5, 19-20, 22, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas as applied to claim 1 or 16 or 39 above, and further in view of Montero et al.

24. As per claim 2, Bodas teaches a cooling system is operable to cool the at least one computer system [270 fig. 3]. However, Bodas does not teach the determining whether sufficient cooling resource are available and placing at least one component of the at least one computer system in a lower state in response to insufficient cooling resources.

Montero et al. teach another computer system includes a plurality of cooling fans configured to provide sufficient cooling to the system. Specifically, Montero et al. teach determining whether insufficient cooling resources are available for cooling the at least one computer system [paragraph 0028, 0039]; and

placing at least one component of the at least one computer system in lower-power state in response to insufficient cooling resources being available to cool the at least one computer system [paragraph 0045-0046].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have modified the system of Kling et al. with the determining of cooling resources of Montero et al. to placing at least one component of the at least one computer system in a lower state in response to insufficient cooling resources.

The motivation for doing so would have been to prevent damage to the computer system due to insufficient cooling.

Therefore, it would have been obvious to combine Kling et al. with Montero et al. to obtain the invention as specified in claim 2.

25. As per claim 3, Montero et al. teach determine whether excess cooling resources are available for cooling the at least one computer system [From table 3 and paragraph 0046[2]]; and

placing the at least one component of the computer system currently in lower-power state [operating speed at 50%] in a higher-power state [operating speed at 75% inherently at full speed], such that the at least one component consumes more power, in response to excess cooling resources being available.

26. As per claim 5, Montero et al. teach determining whether insufficient cooling resources are available for cooling the at least one computer system comprises determining whether an amount of cooling fluid distributes to the at least one computer system exceeds a threshold associated with the maximum capacity of the cooling system [Table 3 – When both fans are operating and the temperature still increasing up to 96 degree].

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[2] the decrease of temperature indicated that excess cooling resources are available.

27. As per claim 19, Montero et al. teach the power provisioning system is connected to a cooling system [287 fig. 2B] and is operable to receive messages from the cooling system [inherent] associated with the availability of cooling resources for cooling the at least one computer system, the power provisioning system being operable to control the power consumption of the at least one computer system based on a message received from the cooling system [fig. 3].

28. As per claim 20, Montero et al. disclose the power provisioning system is operable to place at least one component of the at least one computer system in a lower-power state in response to receiving a message from the cooling system indicating that insufficient cooling resources are available for cooling the at least one computer system [inherently from Table 3 paragraph 0045].

29. As per claim 22, Montero et al. disclose the one or more components comprise a processor, and the power provisioning system is operable to instruct the processor to reduce clock speed for reducing power consumption [paragraph 0046].

30. As per claim 40, see discussion in claim 2.

31. Claims 6, 8, 15, 28, 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas as applied to claim 1 or 16 or 39 above, and further in view of Kling et al (Kling) US 20010003207.

32. As per claim 6, Bodas does not teach comparing the amount of power consumed by the at least one computer system to a second threshold.

Kling teaches another method relates to computer systems and more particularly to limiting the power consumed in computer system by throttling the power consumed by an component in the computer system in response to a high power condition. Specifically, Kling teaches comparing the amount of power consumed by the at least one computer system to a second threshold [paragraph 0035 – total power consumption reaches the lower threshold];

placing the at least one component of the computer system, currently in a lower-power state, in a higher-power state, such that the at least one component consumes more power, in response to the amount of power consumed by the at least one computer system being less than the second threshold [paragraph 0035].

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Bodas with the second threshold of Kling order to allow the system to resume operation at full speed without damaging the system.

33. As per claim 8, Kling et al. disclose one or more of the threshold based on the maximum power output of the power supply and the second threshold is determined such that a minimal change in power consumption does not result in changing a power state of the at least one component [paragraph 0033].

34. As per claim 15, Kling et al. disclose placing one or more components in a lower state comprises reducing power consumption of one or more of a processor [paragraph 0031].

35. As per claim 28, see discussion in claim 6.

36. As per claim 39, see discussion in claim 6.

37. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas as applied to claim 1 above, and further in view of Bradley et al. US 20030177406.

38. As per claim 9, Bodas teaches the replacing the at least one component in a lower power state in response to the thermo-coupled in order to cool those computer system. However, Bodas does not teach placing the at least one component of the at least one computer system in a lower power state in response to the cooling efficiency of the components.

Bradley et al. teach another method for managing power consumption in a computer server. Specifically, Bradley et al. teach determining a cooling efficiency of components in the at least one computer system [42-46 fig. 4]; and

selecting one or more of the components to be placed in a lower power state based on an amount of energy needed to cool the one or more components; wherein a component requiring more energy to be cooled is selected before a component requiring less energy to be cooled [46-47 fig. 4].

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Bodas with the placing of the at least one

component of the at least on computer system in a lower power state in response to the determining of its cooling efficiency as taught by Bradley et al.

The motivation for doing so would have been to provide the system a more efficient way to selectively place the at least one component of the computer system in a lower-power state.

39. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas as applied to claim 1 above, and further in view of Oehler et al. US 20040003303.

40. As per claim 11, Bodas teaches deceasing the power to one or more components by throttling to one or more components in a computer system. However, Bodas does not teach expressly a processor is operable to be placed in multiple lower-power states.

Oehler et al. teach another method and apparatus for static and dynamic power management of computer system. Specifically, Oehler et al. teach a processor for the at least one computer system is operable to be placed in multiple lower-power states, each lower-power state being associated with a lower clock speed [paragraph 0036-0037].

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Kling et al. with the processor for the at least one computer system is operable to be placed in multiple lower-power state as taught by Oehler et al. since the multiple lower-power state is well know in art for ACPI system.

41. As per claim 12, the system of Bodas modified by Oehler et al. teach a system is operable to instruct the processor to be place in one of the multiple lower power state but do not specifically teach placing the processor in one of the multiple lower-power states comprises

instruction the processor not to consume more than a predetermined amount of power. However, it would have been obvious to one of ordinary skill in the art that, by instructing the processor to be in one of the multiple lower power state, the system specifically instructed the processor not to consume more than a predetermined amount of power.

42. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas as applied to claim 1 above, and further in view of Oprescu et al. U.S. patent 5,752,046.

43. As per claim 13, Bodas teaches placing one or more components of the at least one computer system in a lower-power state comprises determining the one or more components to be placed in a lower power state base on the priority information. However, Kling et al. do not teach expressly the storing of information including components in the at least one computer system, power state of the components, power consumption of the component.

Oprescu et al. teach another power management system that capable of tracking the total amount of power drawn from a bus by devices connected to the bus. Specifically, Oprescu et al. teach a repository [50 fig. 2] storing power state information including power consumption and priority information, wherein the power provisioning system is operable to utilize the power state information to identify a component of the one or more components [col. 8 lines 43-51] to be placed in a lower-power state or a higher power state [109, 114, 115 – 110 fig. 2].

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Bodas with the repository storing power state information as taught by Oprescu et al. in order to provide the power controller the ability to

precisely determining the actual power requirements of devices and more effectively controlling the operation of the devices to efficiently utilize available power [col. 3 lines 1-14].

44. As per claim 14, Bodas teaches placing the at least one component of the computer system currently in a lower power state in a higher power state. However, Bodas system modified by Oehler et al. do not teach placing the component in to a higher power state based on the stored information. However, it would have been obvious to one of ordinary skill in the art that, since the system placing a component into the lower power state base on the stored information, the system would included the claimed placing of a component into the higher power state based on the stored information.

45. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas as applied to claim 16 above, and further in view of Lee et al. US 20030204762.

46. As per claim 23, Bodas teaches the control [power provision] can control a computer device to operate at less than maximum load. However, Bodas does not teach expressly the control is operable to instruct the processor to reduce power consumption of the processor to a calculated value or range of values.

Lee et al. teach another method for dynamically adjusting power consumption for a computer system when the power consumption exceeds the predetermined maximum power supply output [paragraph 0022]. Specifically, Lee et al. teach expressly the control is operable to instruct the processor to reduce power consumption of the processor to a calculated value or range of values [table 1 of p. 1; paragraph 0023-0024].

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Bodas with the reduction of power consumption of the processor to a calculated value or range of values as taught by Lee et al. in order to allows the system to efficiently operate without exceeding maximum power output of a power supply.

47. As per claim 24, Lee et al. teach the one or more components comprises a processor operable to be placed in one of multiple lower-power states [table 1 p. 1].

48. Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bodas as applied to claim 16 above, and further in view of Oprescu et al.

49. As per claim 26, Bodas teaches the power control, when the amount of power consumed by the at least one computer system exceeded a threshold, selectively powering off lower priority devices to reduce the power drawn. However, Bodas do not teach a repository storing power state information for the one or more of components in the at least one computer system, wherein the power provisioning system is operable to utilize the power state information to identify a component of the one or more components to be placed in a lower-power state or a higher power state.

Oprescu et al. teach another power management system that capable of tracking the total amount of power drawn from a bus by devices connected to the bus. Specifically, Oprescu et al. teach a repository [50 fig. 2] storing power state information, wherein the power provisioning system is operable to utilize the power state information to identify a component of the one or

more components [col. 8 lines 43-51] to be placed in a lower-power state or a higher power state [109, 114, 115 – 110 fig. 2].

At the time of the invention was made, it would have been obvious to one of ordinary skill in the art to have modified the system of Bodas with the repository storing power state information as taught by Oprescu et al. in order to provide the power controller the ability to precisely determining the actual power requirements of devices and more effectively controlling the operation of the devices to efficiently utilize available power [col. 3 lines 1-14].

50. As per claim 27, Oprescu et al. teach the power state information comprises one or more of power consumption of the one or more components and priority information associated with prioritizing the one or more components for changing the power state of the one or more components [50 fig. 2].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vincent T. Tran whose telephone number is (571) 272-7210. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas c. Lee can be reached on (57 1)272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vincent Tran